Activity 1

Objective

To add two one-digit numbers

Material Required

Waste aluminium foil, chart paper, U-clip, thread, needle, sketch pen, die

Method of Construction

1. Take waste aluminium foil, Make small balls (say 30) of same size using waste aluminium foil (Fig.1).

Fig. 1

2. With the help of needle and thread make a *mala* of these balls [Fig. 2].

Fig. 2

3. Make square shaped cards (say 30) using a chart paper.

4. Write numbers 1, 2, 3,... on each card (one number on one card) as shown in Fig. 3.

1 2 3 4 5 30

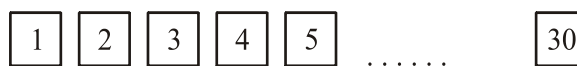



Fig. 3

5. Put a U-clip on each card [Fig. 4].

1 2 3 ......

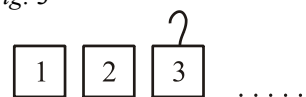



Fig. 4

Demonstration

1. Divide the whole class into groups each of 4 students. Two students will hold the *mala*.

2. One student will throw the die and read the number which appears on the die (say 5).
3. The other student will pick the card with number (5), count the balls and pin the number tag on the *mala*.
4. Again the die is thrown. If 3 appears on the die then the child will count three balls after 5 and put a number tag of 3. [Fig. 5].

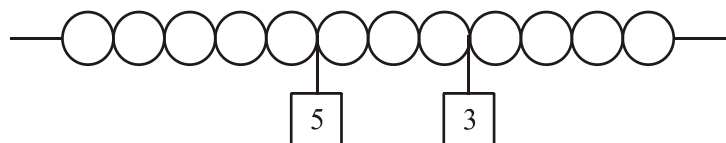



Fig. 5

5. Now a child will count all the balls upto the number tag 3 and put a new number tag of 8 and remove other earlier tags. [Fig. 6].

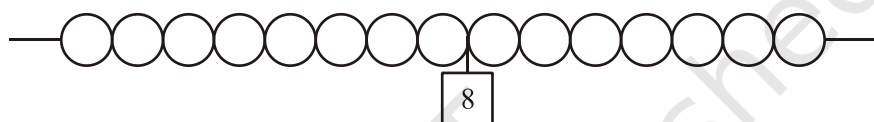



Fig. 6

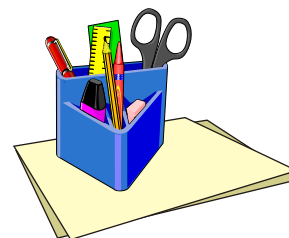
6. Thus we obtain 5 + 3 as 8. The activity may be repeated a number of times by other children.

Observation

Child	Number (on first throw)	Number (on second throw)	Sum	Total
1	5	3	5 + 3	8
2	—	—	—	—
3	—	—	—	—
4	—	—	—	—
5	—	—	—	—

Application

1. This activity is useful in understanding the addition of one digit numbers through concrete objects.
2. The activity can be extended to understand the sum of two-digit numbers by taking *mala* consisting of 100 balls/beads.

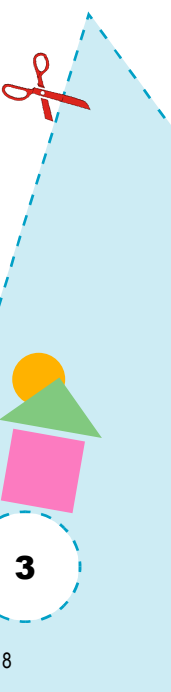
Activity 2

Objective

To develop the sense of estimation in addition and subtraction of numbers

Material Required

Pebbles or bottle caps, pencil/pen, paper.

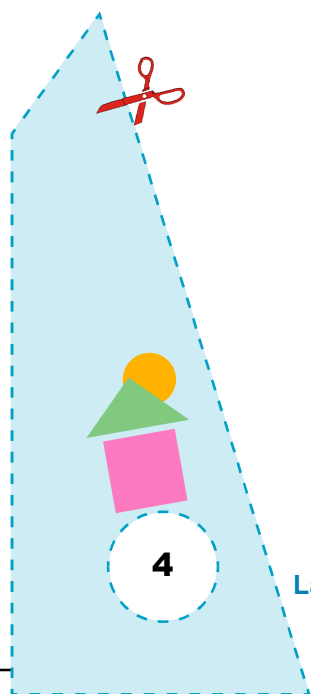
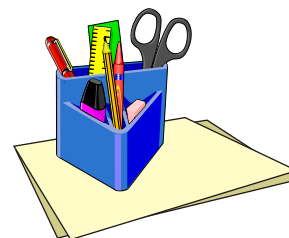
Demonstration

1. Children can sit in groups, of say 5. All the pebbles are kept in the centre.
2. On her turn each child in a group will pick up in both hands as many pebbles as she can. She then estimates the number of pebbles in both of her hands and tells the number to her group.
3. The other children in the group count the pebbles and tell the actual number of pebbles and place the pebbles back into the heap.
4. They then compare the two numbers and write in the table/notebook. A child whose estimated number is very close to the actual number will be the winner.
5. The other groups will also perform the same activity.

Observation

Group	Child	Estimated number	Actual number	Difference	
				Less	More
I	1	5	7	2	—
	2	—	—	—	—
	3	—	—	—	—
	4	—	—	—	—
	5	—	—	—	—
	⋮	⋮	⋮	⋮	⋮

Application

1. This activity is useful in understanding the meaning of estimation and also of addition and subtraction of numbers.

2. The activity can further be played among the winners of all the groups.

Activity 3

Objective

To understand tens and ones

Material Required

Straws, rubber band, scissors, die, paper, pencil

Method of Construction

1. Take some straws, say 200. They can be used straws also.
2. Cut them into small equal parts (say 6 cm.) [Fig. 1].

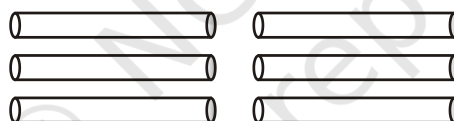
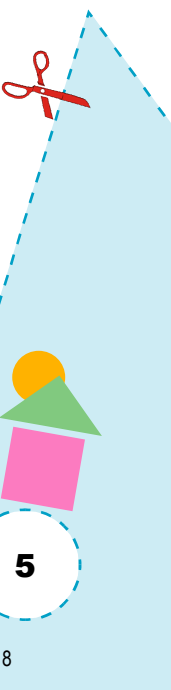



Fig. 1

Demonstration

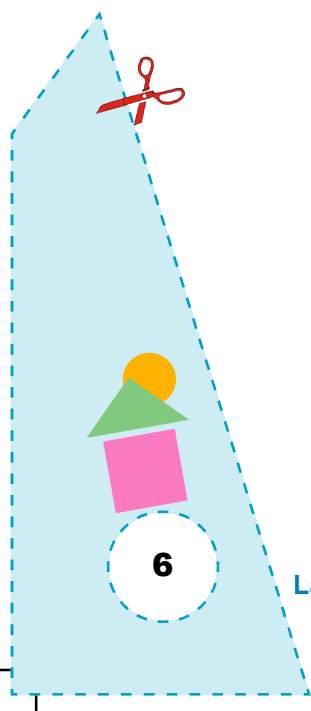
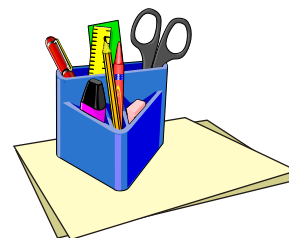
1. Class may be divided into groups each of say 4 children.
2. In one of the groups a child will throw a die and pick up the straws corresponding to the number appearing on the die.
3. The other child of the group will then throw the die and pick up the straws by counting them according to the number on the die.
4. Repeat this activity for all the children in the group.
5. When the number of straws picked are more than 10, then the students will make bundles of 10 using rubber band. Each child in the group

will make her bundles and keep the loose straws separately. Each one will count the bundles and the loose straws and keep a record of it.

6. The students in the group will count and find who got the maximum number of straws. The same activity will be performed in the other groups.

Observation

Group	Name of student	Number of bundles	Number of loose straws	Total Number of straws
I	1	—	—	—
	2	—	—	—
	3	—	—	—
	4	—	—	—
	⋮	⋮	⋮	⋮

Application

1. This activity can be used to understand the idea of tens and ones.
2. This activity may be extended to explain the meaning of hundreds, tens and ones also, depending on the number of straws.

Activity 4

Objective

To explore even and odd numbers in a playful manner

Material Required

Pebbles, bottle caps, cubes etc.

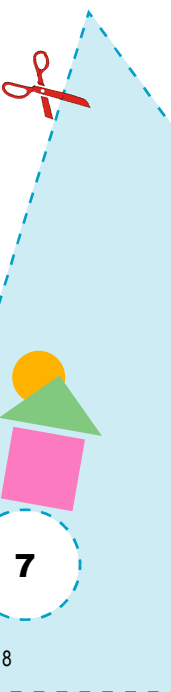
Demonstration

1. Take 10 pebbles or bottle caps. Ask any two children to pick 1 pebble each turn by turn till each one of them gets equal number of pebbles. See if any pebble is left at last.
2. Now take 14 pebbles and repeat the same activity with two other children. See if any pebble is left this time.
3. Again take 11 pebbles and ask two children to pick 1 pebble each when their turn comes till each one of them gets equal number of pebbles. See whether a pebble is left or not.
4. Repeat the same activity with 15 pebbles. See whether a pebble is left or not.
5. Vary the number of pebbles and repeat the activity.

Observation

1. The number of pebbles left in:

   Step 1 : ______ Step 2 : ______

   Step 3 : ______ Step 4 : ______

2. In step 1, the number of pebbles = 10. Number of pebbles left = 0.

   In step 2, the number of pebbles = ____. Number of pebbles left = ___.

   Numbers such as 10, 14, ... are even numbers

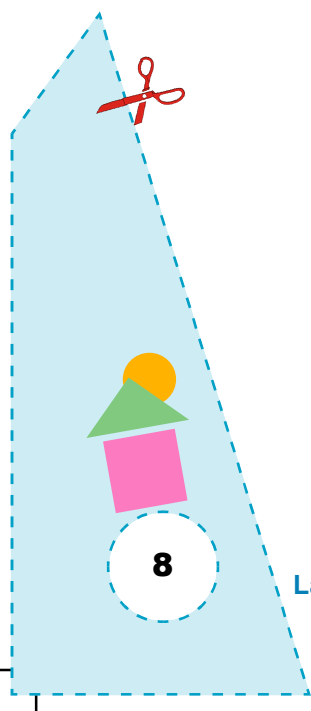
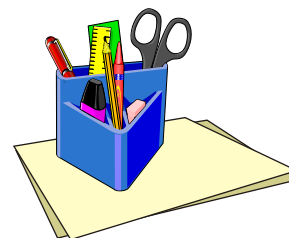
3. In step 3, number of pebbles left = 1.

   In step 4, number of pebbles left = ____.

   Numbers such as 11, 15, ... are called odd numbers.

APPLICATION

1. After doing this activity several times with different number of pebbles each time, the children will know the difference between the two types of numbers i.e. even and odd.

2. This activity can also be performed by a single child by picking up 2 pebbles at a time and concluding whether the given number of pebbles is odd or even.

Activity 5

Objective

To form two-digit numbers from any two-digits and to compare them

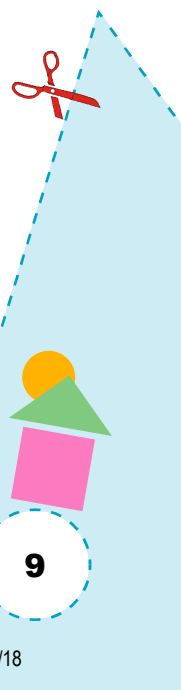
Material Required

Cardboard, pastel sheet, chart-paper, scissors, sketch pens, pencil.

Method of Construction

1. Take a cardboard or pastel sheet and cut out ten square pieces of equal-size from it.
2. Write digits 0, 1, 2, 3, 4, 5, 6, 7, 8, 9 on these ten square pieces (one digit on one piece).

Demonstration

1. The whole class may be divided into groups (of say 5).
2. The set of square pieces will be kept upside down on a table before the groups.
3. Each child will pick up any two pieces from these ten pieces and make all the possible numbers by placing these pieces side by side. The child will record the numbers on a chart paper.
4. The child will then compare the two numbers and write the bigger number.
5. The other children in the group will do the same activity.
6. From the bigger numbers so obtained, the children will identify the biggest number obtained in the group.

7. Same activity may be repeated in all the groups.

8. Out of the biggest number in each group, let them identify the largest among these numbers.

Observation

Group I

Student	First digit	Second digit	Two digit numbers	Bigger number
1	2	5	25, 52	52
2	—	—	—	—
3	—	—	—	—
4	—	—	—	—

So, biggest number of the Group = _______.

Group II

Student	First digit	Second digit	Two digit numbers	Bigger number
1	—	—	—	—
2	—	—	—	—
3	—	—	—	—
4	—	—	—	—

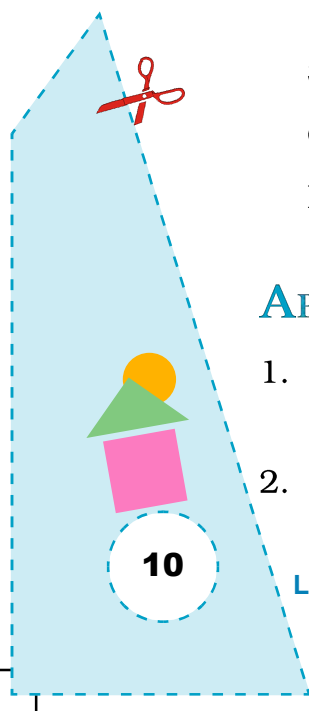
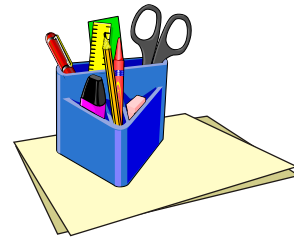
So, biggest number of the Group = _______.

Continue this for the other Groups.

Biggest number among all the groups = _______.

Application

1. This activity is useful in understanding the place value of a digit at tens and ones places.

2. This activity may be extended to numbers of 3 or more digits.

[GAME]

OBJECTIVE

To perform addition and subtraction using even and odd numbers

MATERIAL REQUIRED

Cardboard, white sheet, pen, die, buttons of different colours

METHOD OF CONSTRUCTION

1. Take a cardboard of convenient size and paste a white sheet on it.
2. Teacher may draw a picture of a snake and write numbers from 1–50 as shown in Fig.1.

Fig.1

Let us play

1. The tail of the snake is the starting point. A child will throw the die. She can start and move the button forward only when an odd number comes on the die.
2. After reaching the mouth of the snake (or on number 50), she will start moving backward through the same route only after getting an even number on the die.
3. The game can be played in a group of say 4 and each child will throw a die turn by turn and move forward/backward under the same rules. A child who comes back to the tail first will be declared the winner.

Application

1. The activity is useful in understanding even/odd numbers and also their addition and subtraction.
2. Rules can be modified such as moving forward through even numbers and backwards through odd numbers etc.
3. The game can be extended by increasing the numbers written on the snake to 100.

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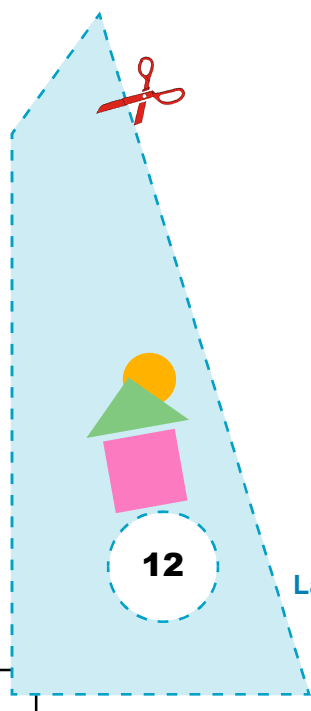
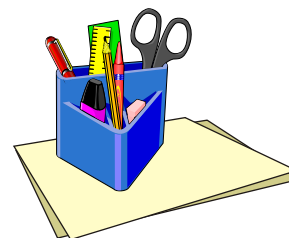

Activity 7

Objective

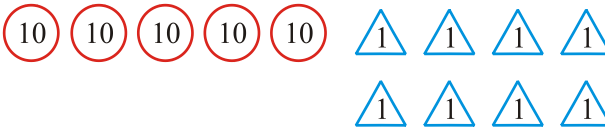
To add and subtract two digit numbers with carrying

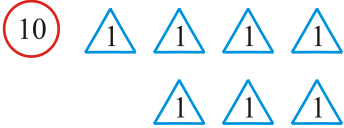
Material Required

Cardboard, cutter, adhesive, markers of different colours, white paper, chart paper

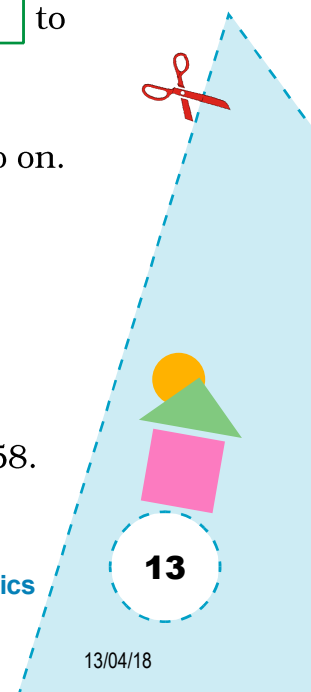
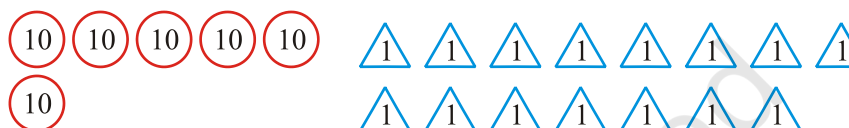
Method of Construction

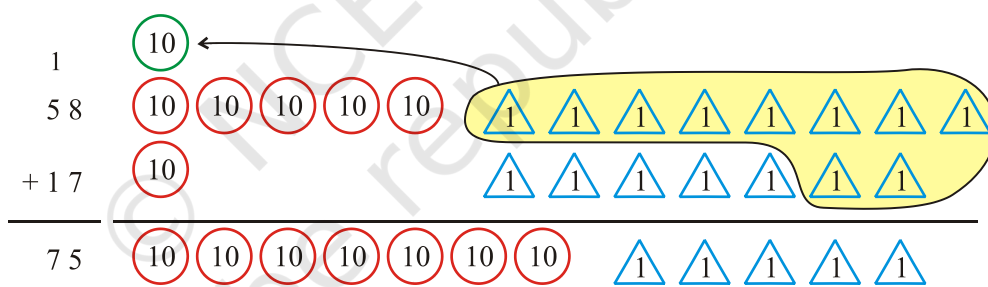
1. Take a cardboard of a convenient size and paste a white paper on it.
2. Take a chart paper and cut out sufficient number of identical pieces of different shapes of the type shown in Fig. 1.

Fig. 1

3. Write number 1 in each △, 10 in each ○ and 100 in each □ to denote one's, tens and hundreds respectively.
4. We can replace one (10) by ten △1 and one [100] by ten (10) and so on.

Demonstration

(A) Addition (say 58 + 17)

1. Take 5 (10) shapes and 8 △1 shapes to represent the number 58.

58 : (10) (10) (10) (10) (10) △1 △1 △1 △1 △1 △1 △1 △1

2. Take one (10) and seven △1 to represent the number 17.

17 : (10) △1 △1 △1 △1 △1 △1 △1

3. To add 58 and 17, write these number as shown below:

58 (10) (10) (10) (10) (10) △1 △1 △1 △1 △1 △1 △1 △1
+17 (10) △1 △1 △1 △1 △1 △1 △1

4. To add, count all △1 shapes. These are 15, which means one (10) (carry) and five △1.

5.

1 (10)
58 (10) (10) (10) (10) (10) △1 △1 △1 △1 △1 △1 △1 △1
+17 (10) △1 △1 △1 △1 △1 △1 △1

75 (10) (10) (10) (10) (10) (10) (10) △1 △1 △1 △1 △1

So, 58 + 17 = 75

This activity may be repeated for addition of various two 2-digit numbers.

(B) Subtraction (say 34 – 19)

1. Take three shapes (10) and four shapes △1 to represent the number 34.

34: (10) (10) (10) △1 △1 △1 △1

2. Take one (10) and nine △1 to represent 19.

19: (10) △1 △1 △1 △1 △1 △1 △1 △1 △1

3. To subtract 19 from 34, write these numbers as shown below.

4. 9 ones cannot be subtracted from 4 one's. So, convert one (10) into ten one's as shown below.

(Pair nine △1 from 34 and nine △1 from 19.)

This activity may be repeated for subtraction of any two 2-digit numbers.

Observation

(A) Addition

Complete the following table:

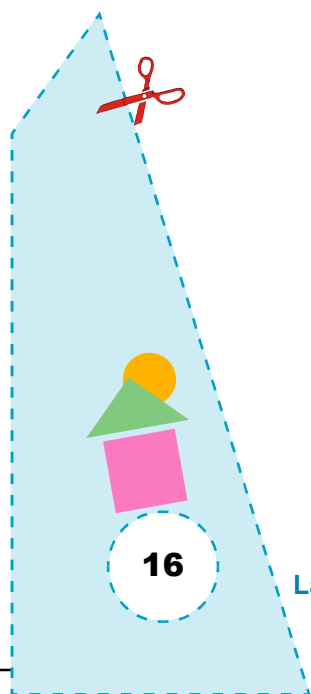
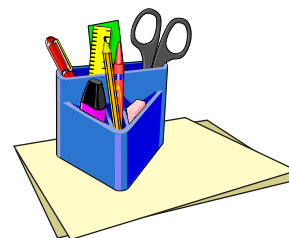
S. No.	First number	Second number	Sum
1	28	15	—
2	72	65	—
3	65	11	—
⋮	⋮	⋮	⋮

(B) Subtraction

Complete the following table:

S. No.	First number	Second number	First number–second number
1	23	9	23 – 9 = _______
2	85	46	85 – 46 = _______
3	78	65	78 – 65 = _______
⋮	⋮	⋮	⋮

Application

1. This activity may be useful in explaining the process of addition and subtraction (with or without carrying) of 2 digit numbers.
2. This activity may be extended for the addition and subtraction of 3 digit numbers.

Activity 8

Objective

To form three-digit numbers using digits

Material Required

Empty shuttlecock box (cylindrical shape), adhesive, transparent sheet, scissors, markers (blue/black/green/red), pen/pencil, cello-tape, white sheet, five rubber bands

Method of Construction

1. Take an empty shuttlecock box.
2. Wrap one piece with white sheet on it.
3. Cut three rectangular strips of about 2 cm width from a transparency sheet.
4. Write digit 0 to 9 vertically on each strip [Fig. 1] with markers of different colours.

0
1
2
3
4
5
6
7
8
9

Fig. 1

5. Colour the box anywhere (1cm. width) in yellow colour [Fig. 2]

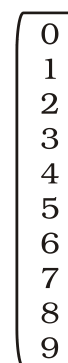
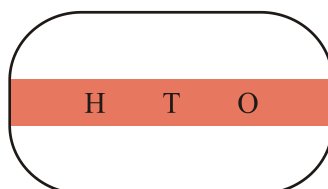



Fig. 2

6. Write O, T and H as shown in Fig. 2 on the box.

7. Now roll each strip around on the box, in such a way that its two ends meet. Join the two ends using a cello-tape. If necessary, extra part of the strips may be cut to ensure that the strips move around the box comfortably.

8. Put rubber bands in between the strips to separate them [Fig. 3].

Fig. 3

Demonstration

1. The teacher or a group leader should speak out a three-digit number. Turn by turn all the students will form a particular number by rotating the strips around the box.

2. The number so formed by a student may be checked by other members and corrected immediately (if required).

3. They will then note down the number on the paper. The place value of the digits may also be mentioned.

Observation

Student	Number	Place value of the digits		
1	573	5 Hundreds	7 Tens	3 Ones
2	____	____	____	____
3	____	____	____	____
4	____	____	____	____
5	____	____	____	____

Application

1. This activity is useful in explaining the formation of numbers with the given digits and also the meaning of place value of digits.

2. The activity can be extended to six digit numbers.

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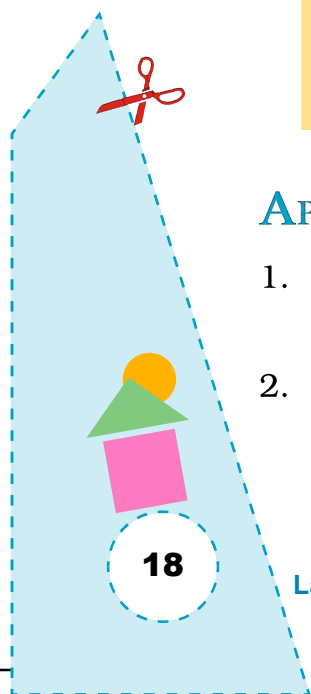
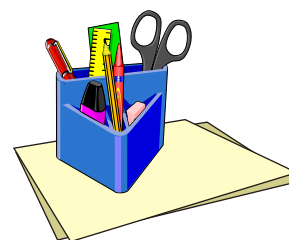

Activity 9

[GAME]

OBJECTIVE

To develop a sense of grouping

LET US PLAY

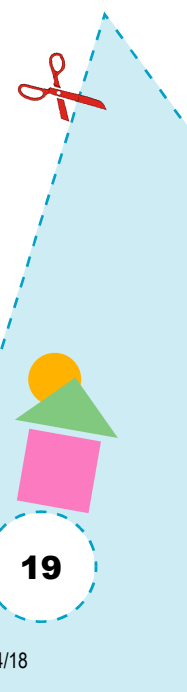
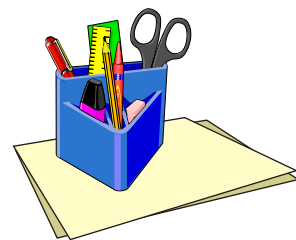
1. Children move in a circle. Teacher says "Bolo Bhai Kitne?" Children say "Aap Bolo Jitne."
2. Then teacher calls out a number 4. The children quickly break the circular chain to rearrange themselves in groups of 4.
3. Whosoever remains without a group (be it a single child student or 2 or 3) is out of the game.
4. Children who remain in the game start moving in a circle again. The teacher says "Bolo bhai kitne" children say "Aap bolo jitne".
5. Then the teacher calls a number 5. Again children will break the circular chain and rearrange themselves in groups of 5. Whosoever remains without a group is out of the game and the game continues.

OBSERVATION

For a group of 30 children

Number called	Number of groups	Number of students out of game	Students remaining in the game
4	7	2	28
5	5	3	25
2	____	____	____
3	____	____	____

APPLICATION

The activity is useful in understanding the concept of division of numbers.

Activity 10

Objective

To do multiplication of numbers using concrete objects

Material Required

Broomsticks, paper, pencil/pen, cardboard, glue

Demonstration

1. Take a cardboard of a convenient size and paste a white paper on it.

2. To perform multiplication of a number 5 with a number, take 5 broomsticks and paste them on the cardboard. (Fig. 1)

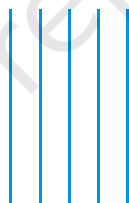
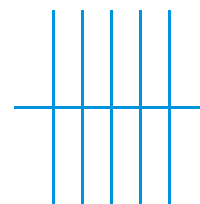



Fig. 1

3. To multiply a number 5 and 1, put one stick horizontally on the 5 vertical sticks on the cardboard as shown in Fig. 2.

4. Count the number of points of intersection as shown in Fig. 3 which is 5.

   $5 \times 1 = 5$

5. Now, place 2 sticks horizontally on the 5 vertical sticks as in Fig. 4. Count the points

Fig. 2

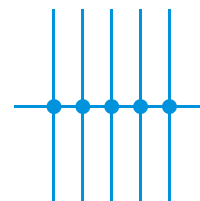
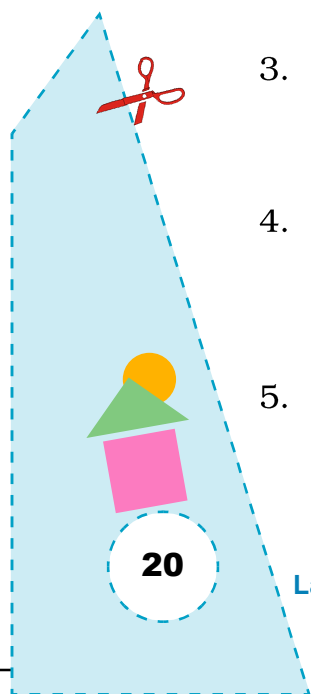



Fig. 3

of intersection. Number of points of intersection is 10.

Thus, $5 \times 2 = 10$

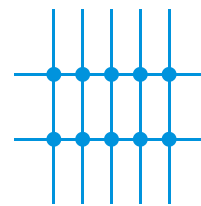



Fig. 4

6. Similarly, place 3 sticks horizontally on the 5 vertical sticks and count the points of intersection, which is 15.

   So, $5 \times 3 = 15$

   In this way, find the product of 5 with any number.

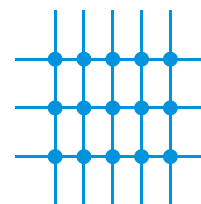



Fig. 5

Observation

1. Number of vertical sticks = _______.

   Number of horizontal sticks = 1.

   Number of points of intersection = _______ = _______ × 1.

2. The number of horizontal sticks = 2

   Number of points of intersection = _______ = _______ × 2.

3. Number of horizontal sticks = 3

   Number of points of intersection = _______ × _______.

   5 × 1 = _____ , 5 × 2 = _____ , 5 × 3 = _____ ,

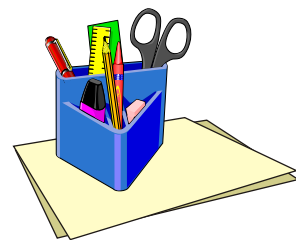
   5 × 4 = _____ , 5 × 5 = _____ , 5 × 6 = _____ ,

   5 × 7 = _____ , 5 × 8 = _____ , 5 × 9 = _____,

   5 × 1 =

Application

This activity can be used in finding product of any two numbers.

Activity 11

Objective

To understand division by grouping

Material Required

Cardboard, paper, sketch pen, scissors, buttons/ counters, bangles.

Method of Construction

1. Take a cardboard and paste a white paper on it.
2. Place bangles (say 6 or 7) in a row on the cardboard (Fig.1).

Fig. 1

Demonstration

1. To divide a number, say 20, by 3, take 20 buttons and put 3 buttons (divisor) inside each bangle (Fig. 2).
2. Place the remaining buttons if any, out side the bangles.
3. The number of bangles filled with 3 buttons is the quotient and the number of buttons left out is the remainder. So in 20 ÷ 3, quotient is 6 and remainder is 2.

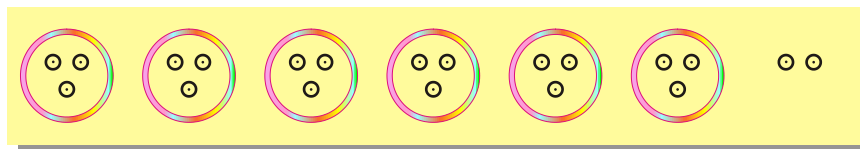



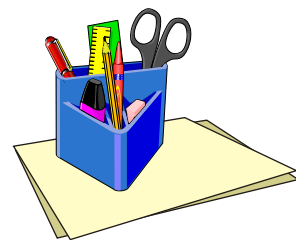
Fig. 2

Observation

S. No.	Division	Quotient	Remainder
1.	16 ÷ 3	5	1
2.	15 ÷ 4	—	—
3.	8 ÷ 2	—	—
4.	10 ÷ 5	—	—

Application

This activity will help the child to understand the division process and also the terms such as dividend, divisor, quotient and remainder.

Activity 12

Objective

To make a tangram and to form different shapes using its pieces

Material Required

Cardboard, grid paper, scissors, pen/pencil, different colours, geometry box, glue

Method of Construction

1. Take a cardboard of convenient size and paste a grid paper on it.
2. Make a square of side, say, 8 units.
3. Draw the line segments as shown in Fig. 1.
4. Cut it along the dotted lines and obtain 7 pieces as shown in Fig. 2.

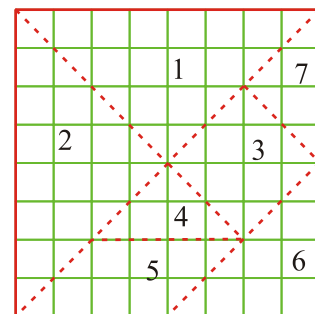



Fig. 1

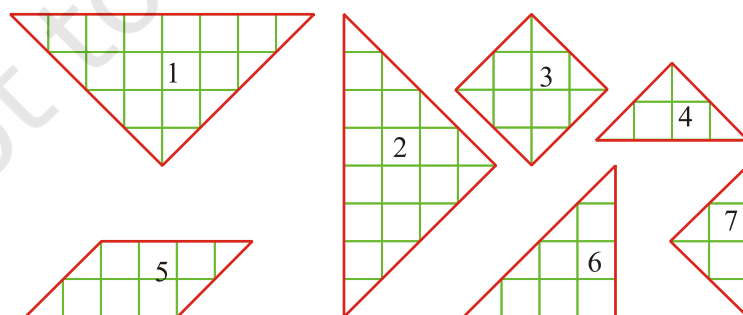
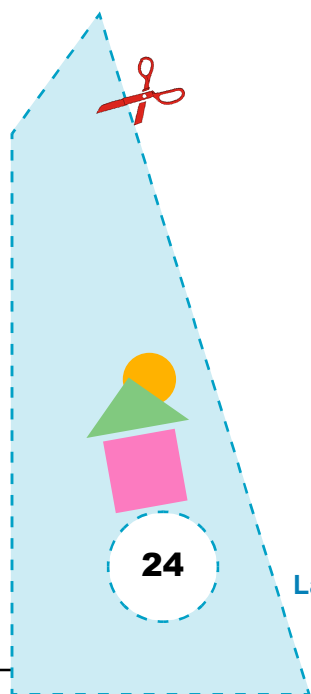



Fig. 2

Demonstration

1. The seven pieces obtained in Fig. 2 are pieces of a tangram.
2. These seven pieces may be arranged in different ways to get different shapes as shown in Fig. 3.

(a)

(b)

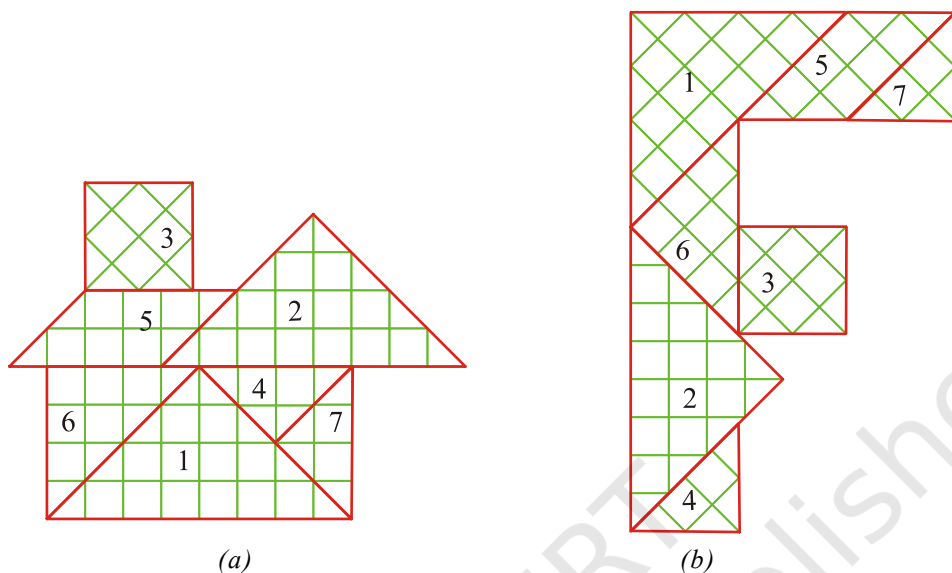



Fig. 3

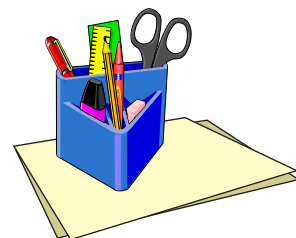
Try to make other shapes using these seven pieces.

Observation

1. Number of pieces of the tangram : __________
2. Number of triangles is : __________
3. Number of parallelograms is : __________
4. Number of squares is : __________
5. Shape in Fig. 3 (a) looks like a : __________
6. Shape in Fig. 3 (b) looks like a : __________

Application

1. This activity helps in understanding different geometrical shapes.
2. Children may form different shapes like letters of English alphabets, digits 0 to 9 using all the seven pieces.
3. Children may be encouraged to make some other shapes/designs using the pieces of tangrams.

Activity 13

Objective

To learn number operations in a known context

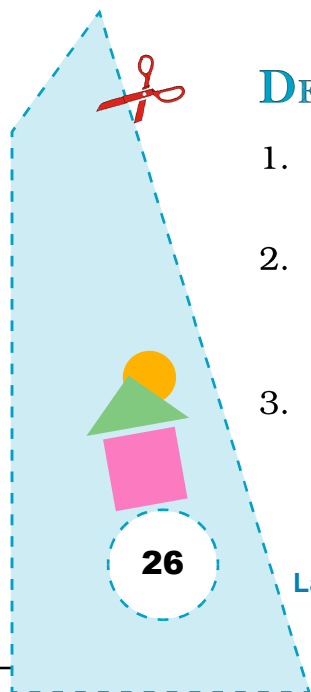
Material Required

Play notes representing Re 1 and other denominations of Rs 2, 5, 10, 20, 50 and 100, wrappers of different things (eatables and daily use commodities), items available in classroom (pencils, erasers, bottles, notebooks) etc., Chart paper, scissors, sketch pen, glue.

Method of Construction

1. Take a chart paper and cut it into small rectangular pieces/tags.
2. Write down the prices of different items such as pencils, erasers, bottle, notebooks etc, available in the classroom.
3. Paste these price tags on the above objects.

Demonstration

1. Ask the children to perform activity in groups of 5. One child will act as shopkeeper and rest of the children will act as customers.
2. Distribute equal amount of money say Rs 100 to each child and also to the shopkeeper child with some money to be used as change. The money should include play notes of different denominations.
3. Ask the children to buy things from the shopkeeper. While buying and selling things, children will do addition, subtraction and multiplication of numbers.

Observation

Each child will prepare his/her own bill as follows:

A B C STORE

BILL

Date: ....

Name: ____________________

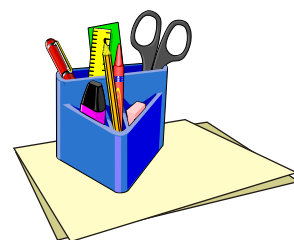
S. No.	Items	No. of items	Rate	Price
1.	Soap	2	5	10. 00
2.				
	Total			

....
.... Signature

In the end, children will calculate how much money is left with each one of them.

Application

1. This activity may help the students to understand different-denominations of currency notes and how to use them in buying and selling.
2. This activity may be extended to notes of higher denominations such as Rs 500 or Rs 1000.
3. This activity will also help the student to know how many 10 rupee notes make a 100 rupee note and so on.

Activity 14

Objective

To convert expanded form of a number into its usual form

Material Required

White paper, pencils, scissors

Method of Construction

1. Take a white paper and cut out rectangular strips (say 20) of equal size (say 10 cm × 2 cm) from it (Fig. 1).

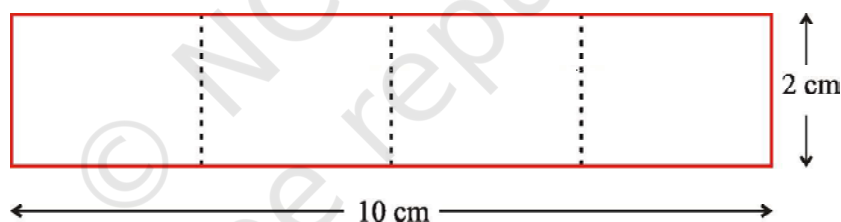



Fig. 1

2. Fold each strip into four equal parts (Fig. 2).

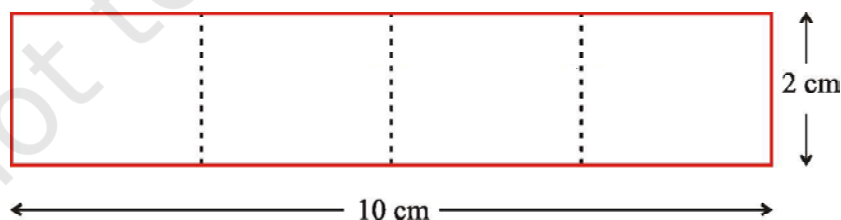



Fig. 2

Demonstration

1. Take a number of four digits written in expanded form say, 2000 + 500 + 60 + 3.

2. Write 2000 in left most part, 500 in the next part, 60 in the next part and 3 in the last part as shown in Fig. 3.

Fig. 3

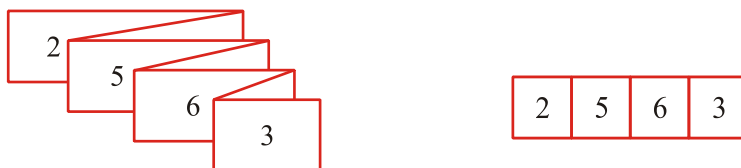
3. Fold the strip as shown below (such that 0's are not visible) (Fig. 4.)

2	5	6	3

Fig. 4

The number so formed is 2563.

Observation

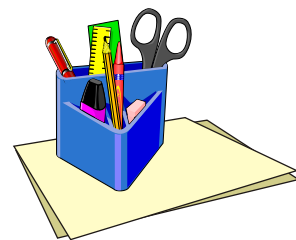
S. No.	Expanded Form	Number
1	2000 + 500 + 60 + 3	2563
2	7000 + 800 + 70 + 1	
3	4000 + 100 + 60 + 3	
4	5000 + 200 + 40 + 9	
. . .	. . .	. . .

Application

1. This activity can be used to write a number from its expanded form and vice-versa.
2. This activity can be extended to build an understanding of place value of digits in a number.

NOTE

This activity may be restricted to a number whose digits are non zero.

Activity 15

Objective

To collect, display and interpret data

Material Required

3 chalk boxes, pebbles/buttons, glue, paper and pencil etc.

Method of Construction

1. Write the names of any three fruits (say, banana, apple and orange), separately on paper slips.
2. Paste them on the chalk boxes, one slip on one box (Fig.1).

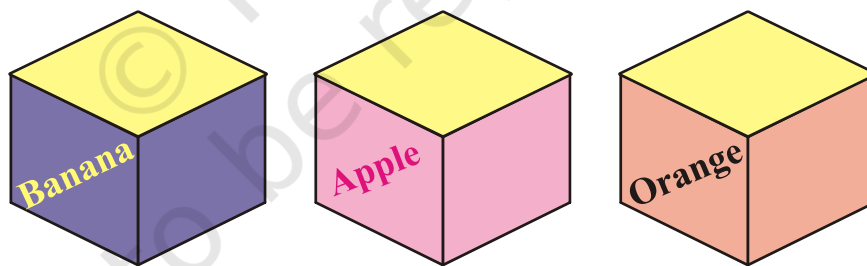



Fig. 1

3. Give one pebble/button to each student of the class.
4. The chalk boxes may be placed on a table or on the floor.

Demonstration

1. Ask each student to drop his/her pebble/button one by one in the box bearing the name of his/her favourite fruit.

2. Teacher will ask any three students of the class to come forward and count the number of pebbles/buttons in each box and write on the blackboard the number of pebbles/buttons in each box.

3. The students should prepare a table as shown below.

Favourite Fruit	Number of students
(banana)	___
(apple)	___
(orange)	___
Total	___

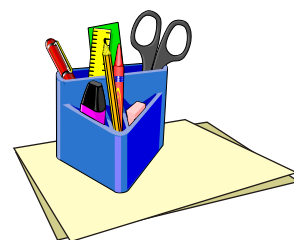
4. In this way, the data is collected regarding the fruits liked by the students.

Observation

1. Number of pebbles/buttons in first Box = ________.
2. Number of pebbles/buttons in second Box = ________.
3. Number of pebbles/buttons in third Box = ________.
4. Maximum number of pebbles/buttons are in ________ Box.
5. The fruit liked by maximum number of children is ________.
6. The fruit liked by least number of students is _______.
7. Total number of pebbles/buttons in the three boxes ________.
8. Total number of students in the class = _________.
9. Is there any student who has not expressed his liking for a fruit?_______.

Application

1. Similar activity can be performed for collecting data such as liking for games, subjects, members in the family etc.
2. The students may be asked to complete the table given in the above observations.

Activity 16

Objective

To find the multiples of numbers 2, 3, 4, 5,....,9

Material Required

Cardboard, thick chart paper, ruler, pencil, eraser, sketch pens of different colours, cutter etc.

Method of Construction

1. Cut a cardboard of size 12 × 12 units.
2. Make a square of size 10 × 10 units on a chart paper and divide it into unit squares. Make 6 copies of it.
3. In one copy write numbers from 1 to 100 in unit squares as shown in Fig. 1 and paste it on the cardboard.
4. Take one more copy from the remaining copies of Step 2, and make holes after leaving one square as shown in Fig. 2.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	38	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Fig. 1

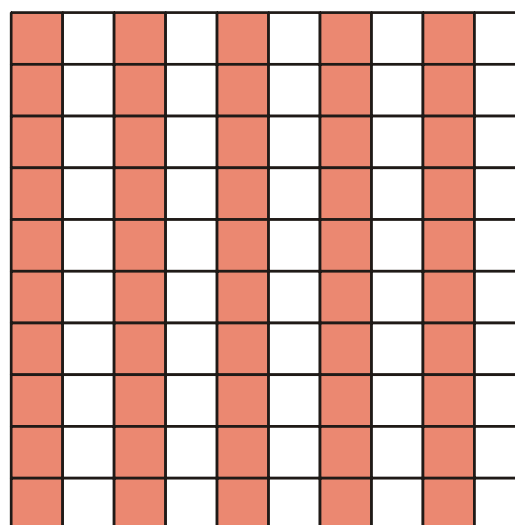



Fig. 2

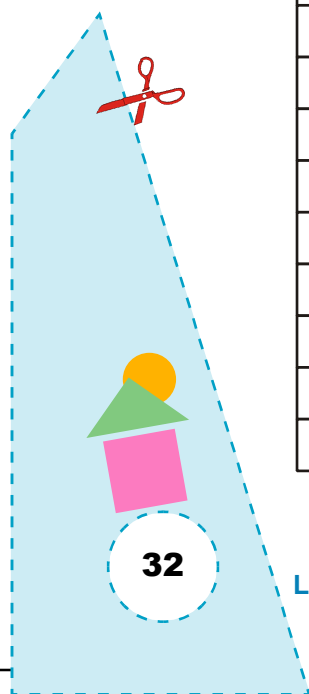
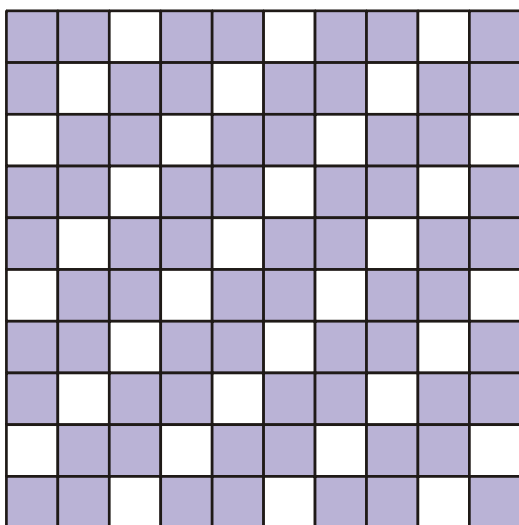
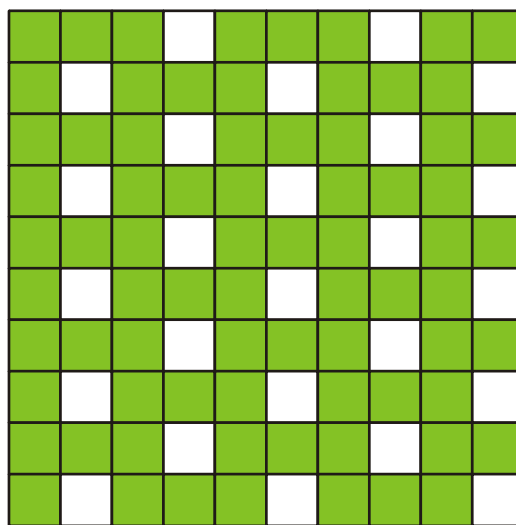
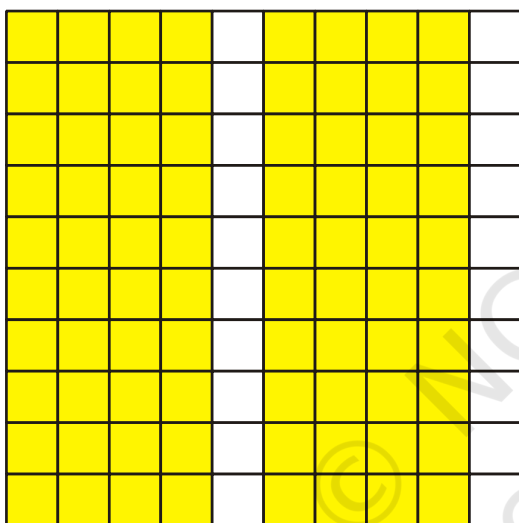
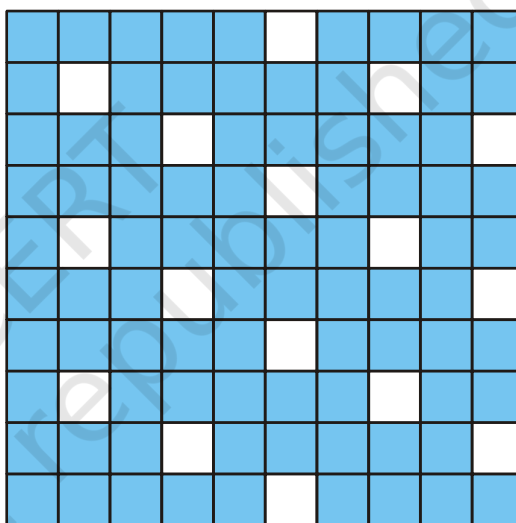



Fig. 3 Fig. 4 Fig. 5 Fig. 6

5. From the other copies make holes after leaving 2 squares, 3 squares respectively as shown in Fig. 3 to Fig. 6.

Demonstration

1. (i) Place the square of Fig. 2 on the square in Fig. 1.

   (ii) The holes will show multiples of 2 as 2, 4, 6, 8, 10, 12, 14,...

2. (i) Place the square of Fig. 3 on the square in Fig. 1.

   (ii) The holes will show multiples of 3 as 3, 6, 9, 12, ...

3. In the same way place the squares of Fig. 4, Fig. 5, Fig. 6, ... on Fig. 1 to get multiples of 4, 5, 6,... respectively.

Observation

Number	2	3	4	5	6	7	8	9
Multiples	2, 4, 6, 8, 10, 12, ...							

Application

1. This activity is useful in finding common multiples of numbers. For example, to find the common multiples of 2, 3 and 4, place the squares of Fig. 2, Fig. 3 and Fig. 4. on Fig. 1. The holes will display common multiples of 2, 3 and 4 like 12, 24, 36, 48, 60, 72, 84, 96.

2. The activity can also be used to find the least common mulitiple of numbers. For example the smallest of the common multiples of 2, 3 and 4 above is 12. It is the Least Common Multiple of 2, 3 and 4.